



CHRONECT™ Workstation PFAS

Science that benefits people

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CHRONECT™ Workstation PFAS

An economical, flexible, efficient lab automation system

CHRONECT™ is built to your needs, using modular components to suit your specific workflow. The CHRONECT Workstation PFAS improves detection of PFAS in environmental matrices by streamlining the sample preparation and analytical process. It encompasses solid-liquid extraction, carbon clean-up, and online SPE LC-MS/MS, based on the compound list and analytical procedures described in US EPA method 1633 for aqueous and solid samples.

CHRONECT offers cost savings and a competitive advantage, with:

- Reduced solvent usage and faster analysis time per sample.
- High-quality samples, delivering high customer satisfaction.
- Integrates with your existing mass spectrometer system.

CHRONECT benefits

Savings

- Reduces the use of solvents by 80%.†
- Improves productivity by reducing the need for manual handling of the sample.†
- SPE cartridge can be used once or multiple times.

† Compared to manual vacuum assisted SPE.

Performance

- Fully automated from sample preparation to final analytical result.
- Peak focusing for improved chromatography of highly polar and unpolar PFAS (from C2 to C18).
- Decreased Mass Spectrometer source maintenance intervals.
- Closed system reduces external sample contamination.

Flexible

- Easily implemented adjustments to the workflow are possible with CHRONOS™ software. The hardware tools and modules are customizable to meet ever-changing requirements.

Compatible

- System-agnostic CHRONOS software interfaces with multiple vendor LC-MS configurations and LIMS systems.

Throughput

- SPE is RFID tagged, so each cartridge is tracked for usage.
- Overlapping time schedules for sample prep and analysis minimizes LC-MS idle time.



HPD

High-Pressure-Dispenser

- Syringe pump connected to ACE and injection valve; delivers solvents and sample through cartridges, elutes the cartridge in peak focusing mode for PFAS analysis.
- Equipped with trap column between HPD and injector for cartridge wash/condition/load.

CHRONECT PAL3

160 cm Dual Head PAL

- Automated sample preparation prior to online SPE LC-MS/MS and autosampler for direct and SPE injections.
- Equipped with a variety of tools and modules, that are configured individually to meet the requirements of PFAS analysis: e.g., vortexer to resolubilize analytes prior to injection, PTFE tubing-free solvent modules and wash stations; automated extraction of solid samples, etc.

COLUMN OVEN

Mistral™ Column Oven

- 100 x 3.0 mm ID, 3 μm, 12 nm C18 analytical column and corresponding guard

MS

Triple Quadrupole Mass Spectrometer

ACE

Automated Cartridge Exchanger

- Places cartridges in flow path and returns them into tray; 4 high-pressure valves set the flow path.
- Cartridges: WAX, ~3 mg sorbent material; 10 x 1 mm; housing material: PEEK.

PUMP

SPH1299 Pump

- Analytical pump running the LC gradient.
- Can elute the cartridge depending on flow path setting; in peak focusing mode for PFAS analysis LC gradient merged with cartridge elution flow through t-rotor seal in valve.
- PTFE eluent tubings + filters replaced with PEEK tubings and stainless-steel frits, trap-column replacing conventional delay column to fully remove background contaminants.

System operation steps

Automated extraction of solid samples



0.1-2 g dried soil or biosolid sample is weighed into a 10 mL magnetic screw cap vial

1

INTERNAL STANDARD ADDITION

1 mL of water is added to the soil to wet the soil matrix and suspend the sample, extracted internal standard solution (EIS-solution) is added to the suspension.

2

EXTRACTION 1

4 mL 0.3% ammonium hydroxide in methanol are added to the sample; extraction for 10 min in vortex mixer. The separation of supernatant by centrifugation and the supernatant transferred into new 20 mL vial.

3

EXTRACTION 2

6 mL 0.3% ammonium hydroxide in methanol is added to the sample with extraction for 10 min using the vortex mixer. The sample is then centrifuged and the supernatant combined with the first supernatant.

4

EXTRACTION 3

2 mL 0.3% ammonium hydroxide in methanol is added to the sample with extraction for 1 min using the vortex mixer. The sample is then centrifuged and the supernatant combined with the first and second supernatant.

5

CLEANUP

A 6 mL aliquot of the combined sample is transferred to a vial containing a loose graphitized carbon. This sample is vortexed for 5 min, centrifuged and neutralized with 5% formic acid.

6

FILTRATION

The extract is filtered through a 0.2 μm polyether sulfone (PES) filter. An aliquot of the filtered extract is transferred into a 1.5 mL vial and mixed with water to reach a composition of 50% methanolic and 50% aqueous. The sample is ready for the online SPE cleanup.

Online SPE LC-MS/MS

Extracts of solid samples and aqueous sample are co-solvated with 50% methanol addition.

7

PREP

The selected SPE cartridge is picked by the gripper of the automated cartridge exchanger (ACE) and placed into left clamp. The cartridge is cleaned, conditioned and equilibrated with 2% ammonium hydroxide in 1% ammoniumhydroxide, methanol, water, 0.3 Molar formic acid, respectively, and delivered from the high-pressure dispenser (HPD).

8

LOAD

The sample is loaded into loop of PAL injection valve and the injection valve switches into inject-position and sample is pushed through onto cartridge with water via HPD.

9

ELUTE

Flow path and cartridge are washed with 0.1 Molar formic acid: water (1:1) and the loaded cartridge is transported to the right-side clamp for elution. The cartridge is eluted with 1% ammonium hydroxide in methanol and merged into the LC flow towards column.

10

ADDITION OF INTERNAL STANDARD

The non-extracted internal standard solution is added to the column flow simultaneously as the sample is eluted into the LC flow to the analytical column.

11

LC-MS/MS ANALYSIS

The LC injection is completed, and the LC gradient analytical analysis commences, the compounds of interest are separated and quantified through LC-MS/MS.



Automation that maximizes laboratory efficiency

The CHRONECT™ Workstation PFAS helps laboratory managers reduce operational costs by lowering solvent consumption and increasing sample throughput compared to traditional cartridge-based manual SPE cleanup methods.

Powered by CHRONOS software, the CHRONECT Workstation PFAS features a multi-system, time-based control mechanism that integrates seamlessly with LC-MS chromatography data systems. This integration enables precise control of sample preparation and analysis in automatically generated overlapping time schedules. The software is compatible with a wide range of LC-MS platforms available on the market.

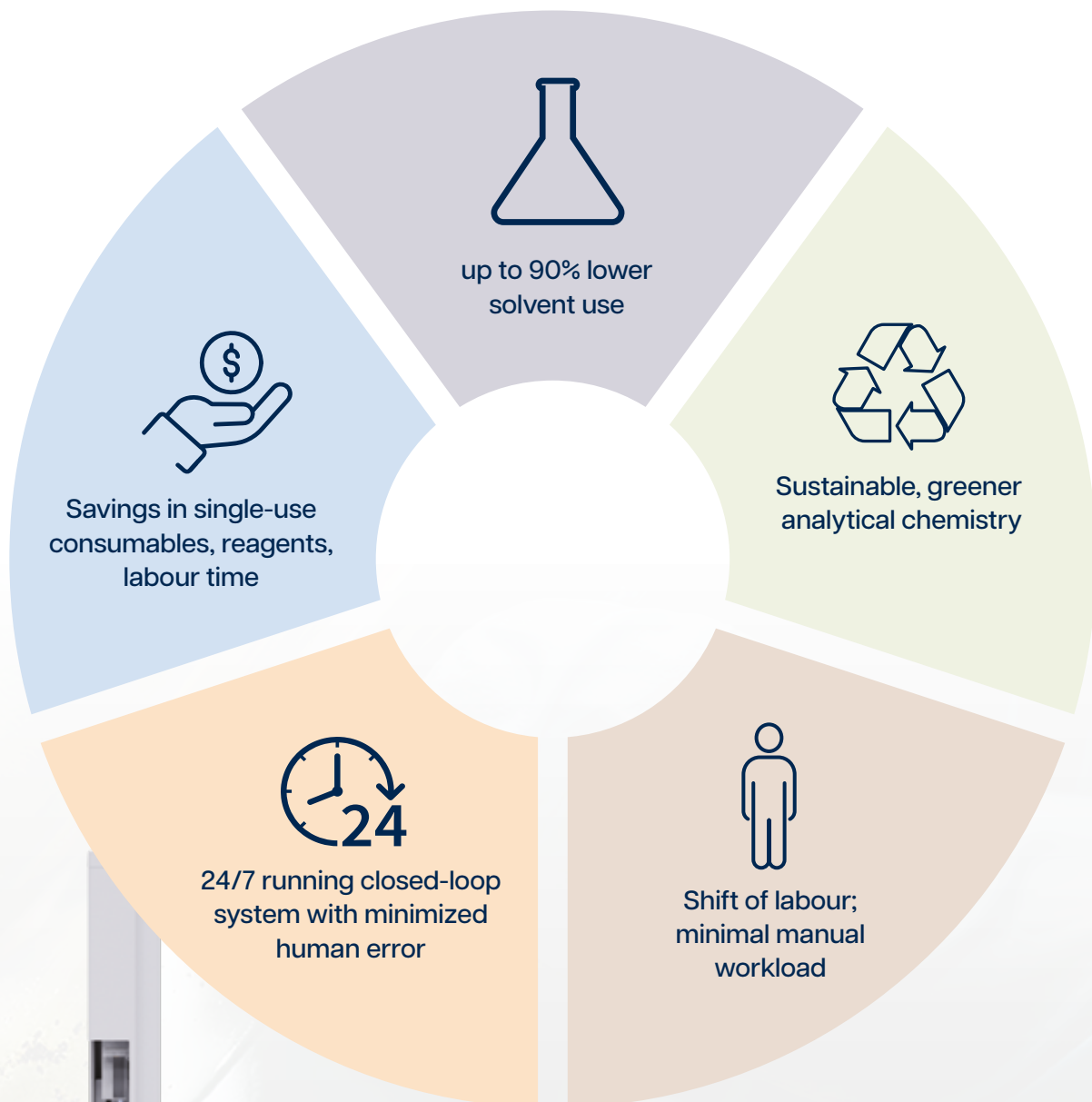
The CHRONECT Workstation PFAS is a comprehensive automated sample preparation solution designed to integrate directly with your existing mass spectrometer, eliminating the need to replace your MS system.

The method incorporates peak-focusing technology, delivering excellent chromatographic performance for all eluted analytes. The proprietary SPE material has been carefully selected to ensure optimal retention of PFAS analytes.

Trajan has rigorously evaluated a range of consumables compatible with the CHRONECT Workflow PFAS system to minimize potential contamination issues that can complicate troubleshooting. Consumables endorsed by Trajan provide stable, low-background analysis, ensuring confidence in your analytical results.

The CHRONECT system features fully automated sample preparation, integrating sample extraction with online SPE directly coupled to the mass spectrometer. This streamlined workflow optimizes the entire analytical process—saving both time and cost.



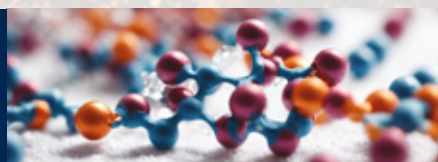




CHRONECT™ Workstation PFAS

The CHRONECT™ Workstation PFAS provides analysis using fully automated online SPE coupled with LC-MS. It allows large-volume injections with higher analyte load and matrix removal. The CHRONECT Workstation PFAS provides a better analytical result with lower solvent use compared to traditional methods.

Visit us at www.trajanscimed.com or contact your regional Trajan representative for more information.



Science that benefits people

Trajan Scientific and Medical develops products and services that can enable critical improvement in the analytical workflow. We aim to have positive impact on human well-being with the delivery of precision products that protect sample integrity and minimize result variation.
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